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54 A device for applying a pretensioned strapping, wrapping or other binding element, such as a thread, a wire, a thin strip, e.g. tape, a thin sheet or film, of flexible material around an object or a number, e.g. a row or a stack, of objects.

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DE-A-2 548 786
GB-A-2 118 516

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EP 0 225 665 B1

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ACTORUM AG

Description

The invention relates to a device for applying a pretensioned strapping, wrapping or other binding element of flexible material, such as a thread, a wire, a thin strip of tape, a thin sheet or film of binding material, around those sides of an object or a number, e.g. a row or a stack, of objects that are at substantially right angles to a conveying track, on which the object is or the objects are moved through the device, said device comprising: two reels, one reel on either side of the track, for the supply of binding material, the pieces of binding material unwound from the two reels having their originally free ends interconnected and constituting together the binding element, a portion of which extends over and transversely of the track and is subjected to tensile stress before the binding cycle starts, two sets of means, one set on either side of the track, for pulling each time from the reels pieces of binding material, of which the lengths are just sufficient to form together a binding element of a length equal to that required for a taut closed loop of binding material encircling the object or objects and apart therefrom a taut piece of binding material extending across the track, two sets of means, one set on either side of the track, for blocking the supply of binding material from the reels, after pieces of binding material of the required lengths have been pulled from reels, said blocking means acting on the end portions of the binding element extending between the reels and the pulling means, said pulling means being also tensioning means adapted to subject pieces of binding material pulled from the reels and with their one ends nearest to the blocking means to a predetermined, if desired adjustable, tensile stress, after the blocking means have stopped the supply of binding material, and to maintain said stress in said pieces of binding material, means for conveying the object or objects along the track, pushing it or them against the taut portion of the binding element extending across the track and moving the object or objects on over such a distance that the binding element is bent around the object or objects in the shape of a U, and two sets of means, one on either side of the track, for forcing the two portions of the thus formed U-shaped binding element which, seen in the direction of transport, protrude rearwards behind the rearside of the object or objects one towards the other, thereafter cutting said portions through in places, in which they are nearest to one another, to form four free end portions of binding material and finally interconnecting said end portions in pairs in such a way, as to form a taut closed loop of binding material around the object or objects on one hand and a new taut piece of binding material stretched across the track for the next binding cycle.

A device for wrapping around a group of objects a resiliently stretchable film of thermoplastic synthetic resin material which, after having been stretched beyond its yield point, tends to return with a certain delay in time toward its original shorter length, said device comprising the above mentioned sets of cooperating means, has been disclosed in

the British patent specification GB-A 2 118 516. This known device is provided, on either side of the track, between the combined pulling and tensioning means and the track with stretching rollers adapted to be driven with different speeds for stretching the film beyond its yield point and to pass the film in temporarily stretched state on to the objects conveyed along the track and to be wrapped in the stretched film. The speed of the conveyor and that of the stretched film supplied to the objects in the track by the stretching device are so correlated, as to ensure that at first the stretched film encircles the stack of objects with little stress only. However, after the completion of the wrapping cycle the tensile stress in the wrap is considerably increased by the shrinking of the wrapping material towards its original state and the separate piece of wrapping material extending across the track for the next wrapping cycle is brought back to its stretched state by driving the stretching rollers in opposite direction. Now, in this known device the mentioned sets of pulling and tensioning means only serve the purpose to subject the pieces of wrapping material supplied to the stretching means to a tensile stress which is sufficient to ensure that said pieces are coupled adequately with the first rollers of said stretching means. This tensile stress is independent of the tensile stress to be set up in the completed wrap.

The present invention has the object to improve in a simple way strapping, wrapping or other binding devices of the kind disclosed, among others, in the published European patent application EP-A 0 061 805 by using the components described in the first paragraph hereabove and forming part of the device according to the above mentioned British patent specification GB-A 2 118 516 for setting up a predetermined tensile stress in the binding element and to maintain said stress during the entire strapping, wrapping or other binding cycle. In devices of the kind described in said European patent application only friction brakes engaging the reels or pieces of binding material pulled therefrom are used to subject the binding material pulled therefrom to tensile stress. However, such friction brakes have several disadvantages. For instance, the tensile force exerted by them depend on the surface conditions of the braking surfaces and the binding material and, what is worse, the tensile stress set up by the friction is only active as long as binding material is pulled from the reels. Consequently, should there be pulled, during the binding cycle, a bit too much binding material from the reels the piece of binding material extending after said cycle across the track and meant for forming the binding loop around the next object or objects will come to hang slacker than allowed. If then the next object is or objects are pushed against the more or less slackly extending piece of binding material and moved on by the conveying means, it may happen that in the corners of the object or group of objects the friction between the element and the object or respective objects is so great that the tensile force exerted by the friction brakes does not suffice to pull the portion of binding materi-

al which lies, seen in the direction of transport, in the front side of the object or group of objects sufficiently tight. The result thereof is that in the completed loop of the tensile stress often becomes too little, since in most cases said stress will be gradually evenly distributed in said loop during the further transport of the wrapped, strapped or otherwise bound object or objects. This troublesome result occurs particularly when rigid, that means non- or little elastic objects such as chests, stacks or rows of stones, bricks, tiles, roofing tiles, etc. are bound in this known manner. If the binding is too slack the danger exists that the bound objects fall out of their binding loops.

Ther improvement aimed at of the strapping, wrapping or other binding devices of the kind disclosed in the said European patent application EP-A 0 061 805 is achieved in that in addition to the use of some of the components of the device described in the mentioned British patent specification GB-A 2 118 516 the portions of the piece of binding material extending between the blocked ends thereof and forming the supplied binding element, said portions extending between said blocked ends and the track, are passed over freely rotatable rollers or idlers only, so that the tensile stress in all parts of the loop of binding material surrounding the object or objects and the tensile stress in the portion of binding material separated from the loop and stretched across the track after completion of the binding cycle are the same and constant and are defined by the combined pulling and tensioning means only. The effect of this even distribution of the tensile stress, both during the binding operation and afterwards, is that the friction on the corners of the object or group of objects is of no consequence anymore, since there is no need for the element to be shifted around said corners.

It has been found advantageous, when on either side of the conveying track at least the combined pulling and tensioning means and the blocking means are mounted on a common plate or other supporting member which is detachably secured to the stationary frame of the device. In that case the improvement according to the invention is easily applicable to known strapping, wrapping or other binding devices, e.g. the device disclosed in the published European patent application EP-A 0 061 805.

The invention will be elucidated with the aid of the accompanying drawing, in which:

Fig. 1 shows a diagrammatical top view of a first embodiment,

Fig. 2 is a diagrammatically illustrated part of a second embodiment and,

Fig. 3 is a perspective view of a part of a third embodiment of the invention.

All three illustrated devices have the purpose to strap, wrap or otherwise bind a horizontal row of rigid, that means non- or little elastic objects 1, e.g. footway paving slabs or roofing tiles. To that end said devices comprise each a horizontal conveying track with conveyor belt 2 provided with driving ledges 3 (see figs. 1 and 3). It will be understood that

the conveying track may also be vertical or inclined, in which cases the transport may be carried out, if necessary, by other means.

Originally, a piece of the required binding element consisting in all three embodiments of two interconnected pieces 6' and 7' of tape emanating from reels 4 and 5 extends transversely over the conveyor belt 2.

If the row of objects is pushed against the piece 6', 7' of tape extending transversely over the conveyor belt 2 and then moved on, the binding element is bent in the shape of a U around three sides of said row, as is shown in Fig. 1. As soon as the rear side of the row of objects has passed photocells 8, 9 the conveyor belt is stopped and the pieces of tape protruding backwards from the rear side of the row of objects 1 are engaged by tape manipulators 10, 11 described in EP-A 0 061 805, thereafter moved towards one another and cut through in places 12, 13, so that end portions 14, 15 and 16, 17 are formed which are so interconnected in pairs as to form a closed loop of tape around the row of objects 1 on the one hand and a separate piece of binding material consisting of two pieces 6', 7' of tape and extending transversely through the conveying track ready for the next following binding cycle on the other hand.

The pieces of tape 6, 7 emanating from the reels 4, 5 are passed successively over guide rollers 22, 24 and 23, 25 to the conveying track. All of these rollers are freely rotatable rollers or idlers. The shafts 26, 27 of the reels 4, 5 can be firmly held by clamping members 28, 29 and are permanently engaged by weak friction brakes 30, 31. The tensioning rollers 20, 21 are rotatably secured to piston rods 32, 33 of pistons (not shown) mounted for reciprocation in cylinders 34, 35 of each of which the active cylinder space is connected to a pressure fluid conduit provided with a pressure limiting device 36, 37 for keeping the pressure prevailing in said cylinder space constant under all circumstances.

The tensioning rollers 20, 21 operate as pulling means and as tensioning means, so that they have each two functions. If the clamping members 28, 29 are inactive, so that the reels 4, 5 are able to be rotated, although slightly braked by the friction brakes 30, 31, pieces 6, 7 of tape are pulled from the reels 4, 5 by the permanently loaded tensioning rollers 20, 21 till said rollers pass with their activating members 38, 39 sensors 40, 41. The effect thereof is that the clamping members 28, 29 are actuated, the reels 4, 5 are blocked and thereafter the tensioning rollers 20, 21 are able to subject the entire piece of binding element 6, 7 pulled from and extending between the reels to a predetermined tensile stress. The task of the friction brakes 30, 31 is to prevent that during the pulling of binding material from the reels 4, 5, the latter rotate too fast and owing to their inertia supply somewhat more binding material than required.

The sensors 40, 41 are situated at some distance from the end of the stroke of the tensioning rollers 20, 21 remote from the cylinders 34, 35, so that, after the activating members 38, 39 have reached the

sensors 40, 41 and thereby the reels are blocked by the clamping members 28, 29, the tensioning rollers 20, 21 remain able to move on a bit to tighten the then slack hanging binding element. After this first part of the binding cycle has come to an end the actual binding operation is started. This means that the conveyor belt 2 pushes the row of objects 1 against the tightened portion 6', 7' of the binding element and by moving on brings said row into the position shown in fig. 1, in which said element partly surrounds the row of objects in U-shape. As the reels 4, 5 remain blocked the tensioning rollers will then be moved from their extreme positions 20', 21', into their positions 20, 21. Thereafter the tape manipulators 10, 11 are moved behind the row of objects 1 towards one another, whereby the tensioning rollers 20, 21 are still further moved in the direction towards the cylinders 34, 35 and will finally arrive at positions 20", 21", in which their activating members 38, 39 have reached positions 38", 39" opposite a second set of delayed action sensors 42, 43. This has the effect that after the adjusted delay the clamping members 28, 29 are put out of action.

The delayed action of the sensors 42, 43 is necessary in order that the tape manipulators 10, 11 have sufficient time to cut through the tape pieces 6", 7" forced in U-shape towards each other and to interconnect the then formed end portions 14, 15 and 16, 17 of tape in pairs, so as to form a closed loop of tape around the row of objects and a separate piece 6', 7' of tape extending between the reels 4, 5 to be used for the next binding cycle.

It will be understood that all sensors 40, 41 and 42, 43 may be adjustably mounted in the device.

As soon as the clamping members 28, 29 have been released the tensioning rollers 20, 21 return from their positions 20", 21" into their extreme positions 20', 21', so that again pieces of tape 6, 7 of sufficient lengths to complete the next following binding cycle are pulled from the reels.

From the above description it will be apparent that the tensioning rollers 20, 21 and their driving means 34, 35 have two functions, viz. the pulling of sufficient lengths of tape from the reels and maintaining a predetermined tensile stress in the tape during the binding operation. Such a double function of tensioning rollers is also found in the device disclosed in the British patent specification GB-A 2 118 516.

In the second embodiment shown in fig. 2, the cylinders 34, 35, the piston rods 32, 33 and the tensioning rollers 20, 21 of the device illustrated in fig. 1 are replaced on either side of the conveyor belt by a set of three guide rollers 45 mounted on a stationary block 44 and a set of two guide rollers 48 provided on a block 47 which is mounted for up and down movement and is loaded by gravity (see weight 46).

Furthermore, in said second embodiment the clamping members 28 do not engage the shaft 26 of the reel 4 but they directly engage the tape 6 near said reel. In this case the block 47 is carrying the activating member 38 which cooperates with sensors 40, 42. Although fig. 2 shows the device mounted on one side of the conveyor belt (not

shown) only, it will be obvious that this device operates in the same way as the device illustrated in fig. 1.

Fig. 3 shows a third embodiment, in which the pieces of tape 6, 7 are also led over two sets of rollers 45 and 48 mounted for movement towards and from one another. The rollers 45 are mounted on stationary axles and the rollers 48, which act as tensioning rollers, are mounted on axles secured to a plate 49. This plate is mounted for reciprocation and attached to the piston rod 52 of a piston 51 provided in a pneumatic cylinder 50. The active right hand cylinder space is connected to a gas supply conduit 53. The pressure prevailing in the cylinder is kept constant by a pressure limiting device 54.

At least the cylinder with piston 51 and piston rod 52, the plate 49 with the set of guide rollers 45, the tensioning rollers 48, the clamping members 28 engaging the tape directly, the sensors (not shown) and the activating member (not shown) attached to the plate 49 are mounted together on a common supporting plate 55, so that this device can be easily mounted on known devices, e.g. the strapping, wrapping or other binding device described in EP-A 0 061 805.

It is observed that the pneumatic cylinder 50 may also be a hydraulic cylinder connected to a liquid conduit provided with a pressure limiting device.

Claims

1. A device for applying a pre-tensioned strapping, wrapping or other binding element (6, 7) of flexible material, such as a thread, a wire, a thin strip or tape, a thin sheet or film of binding material, around those sides of an object or a number, e.g. a row or a stack, of objects (1) that are at substantially right angles to a conveying track, on which the object is or the objects (1) are moved through the device, said device comprising: two reels (4, 5), one reel on either side of the track, for the supply of binding material, the pieces of binding material unwound from the two reels (4, 5) having their originally free ends interconnected and constituting together the binding element (6, 7), a portion (6', 7') of which extends over and transversely of the track and is subjected to tensile stress before the binding cycle starts, two sets of means (20, 21, 32-37; 44-48; 45, 48-52), one set on either side of the track, for pulling each time from the reels (4, 5) pieces of binding material (6, 7), of which the lengths are just sufficient to form together a binding element of a length equal to that required for a taut closed loop of binding material encircling the object or objects and apart therefrom a taut piece of binding material extending across the track, two sets of means (28, 29), one set on either side of the track, for blocking the supply of binding material (6, 7) of the required lengths have been pulled from the reels (4, 5), said blocking means (28, 29) acting on the end portions of the binding element extending between the reels (4, 5) and the pulling means (20, 21, 32-37; 44-48; 45, 48-52), said pulling means (20, 21, 32-37; 44-48; 45, 48-52) being also tensioning means adapted to subject pieces of binding material (6, 7) pulled from

the reels (4, 5) and with their one ends nearest to the blocking means (28, 29) to a predetermined, if desired adjustable, tensile stress, after the blocking means (28, 29) have stopped the supply of binding material, and to maintain said stress in said pieces of binding material, means for conveying the object or objects (1) along the track, pushing it or them against the taut portion of the binding element (6, 7) extending across the track and moving the object or objects (1) on over such a distance that the binding element is bent around the object or objects (1) in the shape of a U, and two sets of means, one on either side of the track, for forcing the two portions (6", 7") of the thus formed U-shaped binding element (6, 7) which, seen in the direction of transport, protrude rearwards behind the rearside of the object or objects (1) one towards the other, thereafter cutting said portions (6", 7") through in places (12, 13), in which they are nearest to one another, to form four free end portions (14, 15, 16, 17) of binding material and finally interconnecting said end portions in pairs in such a way, as to form a taut closed loop of binding material around the object or objects (1) on one hand and a new taut piece (6', 7') of binding material stretched across the track for the next binding cycle, characterized in that of the piece of binding material extending between the blocked ends thereof and forming the supplied binding element the portions which extend between said blocked ends and the track are passed over freely rotatable rollers or idlers only, so that the tensile stress in all parts of the loop of binding material surrounding the object or objects and the tensile stress in the portion of binding material separated from the loop and stretched across the track after completion of the binding cycle are the same and constant and are defined by the combined pulling and tensioning means (20, 21, 32-37; 44-48; 45, 48-52) only.

2. A device according to claim 1, characterized in that on either side of the conveying track at least the combined pulling and tensioning means (45, 48-52) and the blocking means (28, 29) are mounted on a common plate (55) or other supporting member which is detachably secured to the stationary frame of the device.

Patentansprüche

1. Vorrichtung zum Anbringen einer vorgespannten Schnürung, eines Wickels oder eines anderen Bindeelements (6, 7) aus flexiblem Material, wie ein Faden, ein Draht, ein dünner Streifen oder ein Band, ein dünner Zuschnitt oder eine Folie aus Bindematerial um jene Seiten eines oder mehrerer, z.B. reihen- oder stapelförmig angeordneter Gegenstände (1) herum, die im wesentlichen rechtwinklig zu einer, den oder die Gegenstände (1) durch die Vorrichtung hindurchbewegende Transportbahn stehen, wobei die Vorrichtung besteht aus: zwei beidseitig an der Bahn angeordneten Spulen (4, 5) zur Zuführung des Bindematerials, wobei die von den zwei Spulen (4, 5) abgewickelten Bindematerialstücke mit ihren ursprünglich freien Enden verbunden sind und zusammen das Bindeelement (6, 7) bil-

den, von dem sich ein Abschnitt (6', 7') quer über die Bahn erstreckt und vor dem Beginn des Bindevorgangs unter Zugspannung setzbar ist, zwei Sätzen von beidseitig an der Bahn angeordneten Mitteln (20, 21, 32-37; 44-48, 45, 48-52) mit denen von den Spulen (4, 5) jeweils Bindematerialstücke (6, 7) abziehbar sind, die gerade so lang sind, daß sie zusammen ein Bindeelement bilden, das die notwendige Länge hat, um den oder die Gegenstände als gespannte, geschlossene Bindematerialschlinge zu umschließen und daneben ein gespanntes, quer über die Bahn verlaufendes Bindematerialstück zu bilden, zwei Sätzen von beidseitig an der Bahn angeordneten Mitteln (28, 29) zum Blockieren der Bindematerialzuführung von den Spulen (4, 5), nachdem Bindematerialstücke (6, 7) der erforderlichen Länge von den Spulen (4, 5) abgezogen worden sind, wobei die genannten Blockiermittel (28, 29) auf die sich zwischen den Spulen (4, 5) und den Abzugsmitteln (20, 21, 32-37; 44-48, 45, 48-52) erstreckenden Endabschnitte des Bindeelements einwirken und wobei die genannten Abzugsmittel (20, 21, 32-37; 44-48, 45, 48-52) auch Spannmittel sind, die dazu geeignet sind, von den Spulen (4, 5) abgezogen, mit ihren einen Enden den Blockiermitteln (28, 29) nächstliegende Bindematerialstücke (6, 7) unter eine vorgegebene, gegebenenfalls auch einstellbare Zugspannung zu setzen, und zwar nachdem die Blockiermittel (28, 29) die Bindematerialzuführung gestoppt haben, und diese Spannung in den genannten Stücken des Bindematerials aufrechtzuerhalten, Mitteln (2, 3), die den oder die Gegenstände (1) entlang der Bahn transportieren, gegen den gespannten, sich quer über die Bahn erstreckenden Teil des Bindeelements (6, 7) schieben und eine solche Strecke weiterbewegen, daß sich das Bindeelement U-förmig um den oder die Gegenstände (1) spannt und zwei Sätzen von beidseitig an der Bahn angeordneten Mitteln, die die zwei sich in Transportrichtung gesehen nach rückwärts hinter die Rückseite des oder der Gegenstände (1) erstreckenden Abschnitte (6", 7") des so gebildeten U-förmigen Bindeelements (6, 7) aufeinander zu bewegen, anschließend die genannten Abschnitte (6", 7") an den Stellen (12, 13), an denen sie sich am nächsten sind, zur Bildung von vier freien Bindematerialendabschnitten (14, 15, 16, 17) durchschneiden und zum Schluß diese Endabschnitte paarweise derart miteinander verbinden, daß einerseits eine gespannt geschlossene Bindematerialschlinge um den oder die Gegenstände (1) herum und andererseits ein neues, für den nächsten Bindevorgang quer über die Bahn gespanntes Bindematerialstück (6', 7') gebildet wird, dadurch gekennzeichnet, dass die Abschnitte des sich zwischen den blockierten Enden erstreckenden und das zugeführte Bindeelement bildenden Bindematerialstücks, welche sich zwischen den genannten blockierten Enden und der Bahn erstrecken, über frei drehbare Rollen oder nur Umlenkrollen (idlers) geführt sind, so daß die Zugspannung in allen den oder die Gegenstände umgebenden Teilen der Bindematerialschlinge und die Zugspannung in dem von der Schlinge abgetrennten und nach beendigem Bindevorgang über die Bahn gespannten Bindematerialabschnitt, gleich groß und

konstant sind und nur durch die kombinierten Zug- und Spannmittel (20, 21, 32-37; 44-48, 45, 48-52) bestimmt sind.

2. Vorrichtung nach Anspruch 1, dadurch gekennzeichnet, daß auf jeder Seite der Transportbahn zumindest die kombinierten Zug- und Spannmittel (45, 48-52) und die Blockiermittel (28, 29) an einer gemeinsamen, abnehmbar am ortsfesten Rahmen der Vorrichtung befestigten Platte oder einer anderen Unterlage montiert sind.

Revendications

1. Dispositif permettant d'appliquer un élément de cerclage, enveloppement ou autre liage (6, 7) en matériau flexible et soumis à une tension préalable, tel qu'un fil, un fil métallique, un bande ou ruban mince, une feuille ou film mince de matériau de liage, autour des faces d'un objet ou d'un certain nombre, par exemple une rangée ou une pile, d'objets (1) qui sont disposés sensiblement à angle droit par rapport à une voie de transport sur laquelle le ou les objets (1) sont déplacés à travers le dispositif, ce dispositif comprenant: deux bobines (4, 5), une bobine de chaque côté de la voie, servant à la fourniture de matériau de liage, les morceaux de matériau de liage déroulés de ces deux bobines (4, 5) ayant leurs extrémités initialement libres reliées entre elles et constituant ensemble l'élément de liage (6, 7) dont une partie (6', 7') s'étend au-dessus de la voie et transversalement à celle-ci et est soumise à une contrainte de traction avant que le cycle de liage commence, deux jeux de moyens (20, 21, 32 à 37; 44 à 48; 45, 48 à 52), un jeu de chaque côté de la voie, servant à tirer chaque fois, à partir des bobines (4, 5), des morceaux de matériau de liage (6, 7) dont les longueurs sont juste suffisantes pour former ensemble un élément de liage d'une longueur égale à celle requise pour une boucle fermée tendue de matériau de liage encerclant le ou les objets et, en dehors de celle-ci, un morceau tendu de matériau de liage s'étendant en travers de la voie, deux jeux de moyens (28, 29), un jeu de chaque côté de la voie, servant à bloquer la fourniture de matériau de liage à partir des bobines (4, 5) après que des morceaux de matériau de liage (6, 7) aux longueurs requises aient été tirés de ces bobines (4, 5), ces moyens de blocage (28, 29) agissant sur les parties extrêmes de l'élément de liage s'étendant entre les bobines (4, 5) et les moyens de traction (20, 21, 32 à 37; 44 à 48; 45, 48 à 52), ces moyens de traction (20, 21, 32 à 37; 44 à 48; 45, 48 à 52) étant aussi des moyens de mise sous tension agencés de façon à soumettre des morceaux de matériau de liage (6, 7) tirés des bobines (4, 5), par leurs extrémités les plus proches des moyens de blocage (28, 29), à une contrainte de traction fixée, si on le veut réglable, après que les moyens de blocage (28, 29) aient interrompu la fourniture de matériau de liage, et de façon à maintenir cette contrainte dans ces morceaux de matériau de liage, des moyens (2, 3) permettant de transporter le ou les objets (1) le long de la voie en le ou les poussant contre la partie tendue de l'élément de liage (6, 7) s'étendant en travers de la voie et en continuant

de déplacer ce ou ces objets (1) sur une distance telle que l'élément de liage soit plié autour du ou des objets (1) suivant la forme d'un U, et deux jeux de moyens, un de chaque côté de la voie, servant à diriger de force l'une vers l'autre les deux parties (6", 7") de l'élément de liage en forme de U ainsi formé (6, 7) qui, vues suivant la direction de transport, font saillie vers l'arrière en arrière de la face arrière du ou des objets (1), puis à sectionner de part en part ces parties (6", 7") en des emplacements (12, 13) où elles sont les plus proches l'une de l'autre, de façon à former quatre parties extrêmes libres (14, 15, 16, 17) de matériau de liage, et finalement à relier entre elles ces parties extrêmes par paires de manière à former une boucle fermée tendue de matériau de liage autour du ou des objets (1) et un nouveau morceau tendu (6', 7') de matériau de liage tendu en travers de la voie pour le cycle de liage suivant, caractérisé en ce que, du morceau de matériau de liage s'étendant entre les extrémités bloquées et la voie, ne passent que par-dessus des rouleaux ou galets tournant librement, de sorte que la contrainte de traction existant dans toutes les parties de la boucle de matériau de liage entourant le ou les objets et la contrainte de traction existant dans la partie de matériau de liage séparée de cette boucle et étirée en travers de la voie après achèvement du cycle de liage sont les mêmes et sont constantes et ne sont déterminées que par les moyens combinés de traction et de mise sous tension (20, 21, 32 à 37; 44 à 48; 45, 48 à 52).

2. Dispositif suivant la revendication 1, caractérisé en ce que, sur chacun des deux côtés de la voie de transport, au moins les moyens combinés de traction et de mise sous tension (45, 48 à 52) et les moyens de blocage (28, 29) sont montés sur une plaque (55), ou autre élément de support, qui est commune et qui est fixée de manière amovible sur le bâti fixe du dispositif.

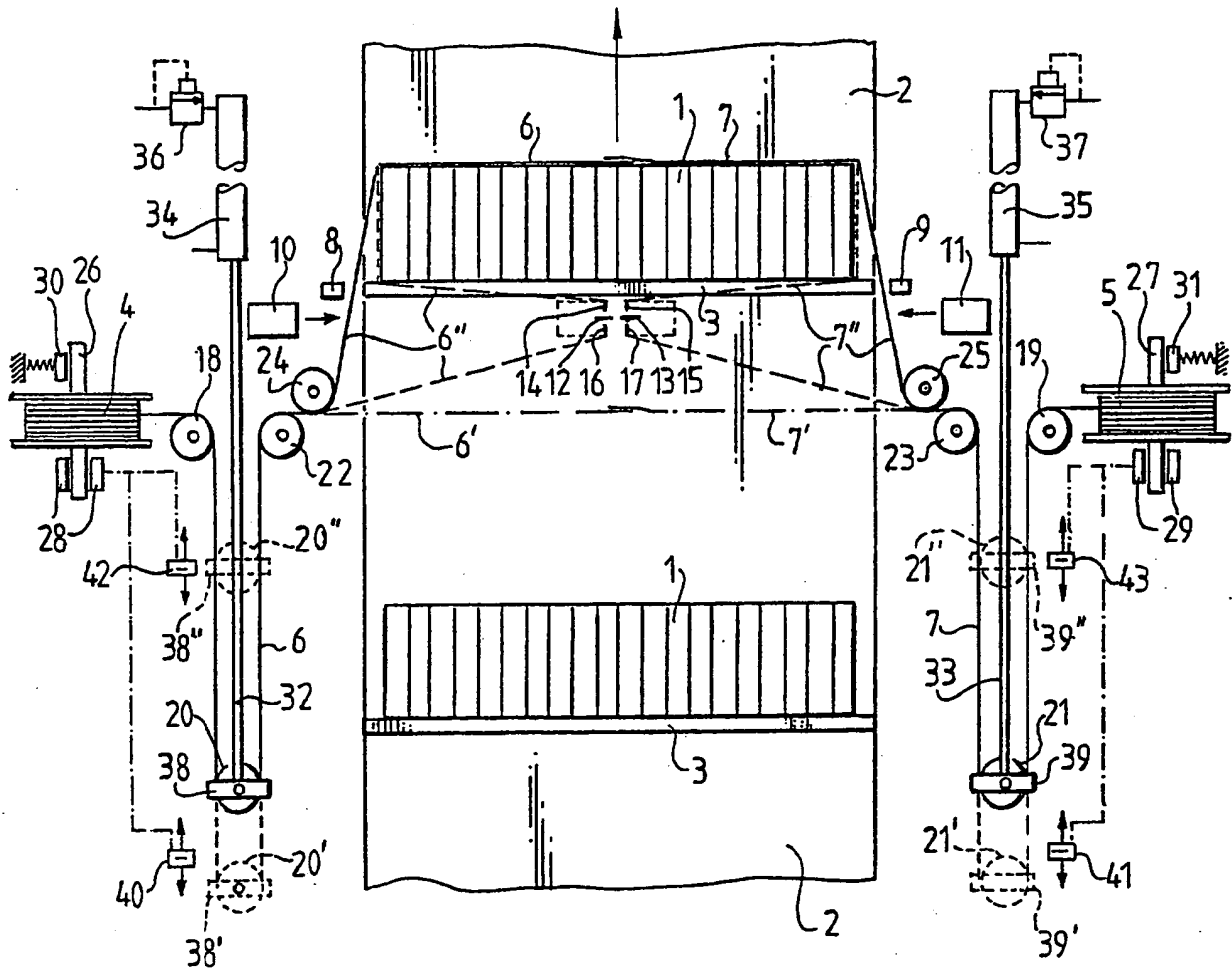


FIG. 1

